

ABSTRACT OF THE DISCLOSURE

As the traffic volume carried by telecommunication networks has been rapidly increased as a result of the bandwidth-intensive applications such as Internet access, electronic commerce, multimedia applications, and distributed computing, it is imperative to utilize the optical network for backbone, metropolitan, and local area networks. The optical networks employing optical fibers as the transmission medium have exhibited a superior performance/cost ratio for both long-haul and short-haul routes and the emerging dense wavelength division multiplexing (DWDM)/all-optical networks have shown a promising potential to improve speed, capacity and connectivity of optical telecommunication networks. The present invention provides Micro-Opto-Electro-Mechanical Waveguide Switch (MOEM-WS) by integrating MEMS actuators and micromachined PLCs on the same substrate. The MOEM-WS is an integrated hybrid microsystem: Micro-Opto-Electro-Mechanical System (MOEMS) and it is particularly applicable for optical cross-connect (OXC) switches and optical add/drop multiplexers (OADM). The MOEM-WS can provide an essential fiber switching capability for DWDM/all-optical networks with numerous accompanying benefits such as low cost, small crosstalk, reliability, compactness, high speed, reconfigurability, modularity, scalability, and insensitiveness to signal wavelength and polarization.